

Claims

What is claimed is:

1. An optical fiber, comprising:
a refractive index profile having
a first moat with a negative delta ($\Delta 2$),
a second moat with a negative delta ($\Delta 4$), and
the refractive index profile is selected to provide
a negative total dispersion at 1550 nm,
a kappa value, defined as total dispersion divided by dispersion slope at 1550 nm, of
less than 75 nm.
2. The fiber of claim 1 further comprising
a central core having a positive delta ($\Delta 1$), and
a ring surrounding the first moat having a positive delta ($\Delta 3$).
3. The fiber of claim 1 wherein the total dispersion at 1550 nm is more negative than about
-40 ps/nm/km.
4. The fiber of claim 1 wherein the total dispersion at 1550 nm is more negative than -40 and
less negative than -400 ps/nm/km.
5. The fiber of claim 1 wherein the total dispersion at 1550 nm is more negative than about
-140 ps/nm/km.
6. The fiber of claim 1 wherein the dispersion slope at 1550 nm is less than -0.75 and greater
than -8.50 ps/nm²/km.

7. The fiber of claim 1 wherein kappa at 1550 nm is between about 40 and 75 nm.
8. The fiber of claim 1 including a pin array bend loss at 1550 nm of less than 9 dB.
9. The fiber of claim 1 wherein a central core has a delta ($\Delta 1$) of less than 2.0 %.
10. The fiber of claim 9 wherein an outer core radius ($R1$) of the central core is between about 1.2 and 3.1 microns.
11. The fiber of claim 9 wherein the central core has an alpha (α) of less than about 6.
12. The fiber of claim 1 wherein delta ($\Delta 2$) of the first moat is less than -0.2%.
13. The fiber of claim 12 wherein an outer radius ($R2$) of the first moat is located between about 4.5 and 10.6 microns.
14. The fiber of claim 1 wherein delta ($\Delta 4$) of the second moat is less than -0.05 %.
15. The fiber of claim 14 wherein an outer radius ($R5$) of the second moat is between about 19.5 and 37.5 microns.
16. An optical transmission line, wherein the fiber as set forth in claim 1 is a dispersion compensating fiber optically coupled to a transmission fiber, the transmission fiber having:
 - a total dispersion between 2 and 6 ps/nm/km at 1550 nm, and
 - a positive dispersion slope of less than 0.092 ps/nm²/km at 1550 nm.
17. The line of claim 16 wherein the transmission fiber comprises a kappa value, defined as total dispersion at 1550 nm divided by dispersion slope at 1550 nm, of between 40 and 75 nm.

18. The line of claim 16 wherein a High-to-Low residual dispersion for the transmission line over an entire C band having a wavelength range from 1525 nm to 1565 nm is less than 50 ps/nm for a 100 km length of transmission fiber.
19. The line of claim 16 wherein the dispersion compensating fiber is optically coupled to a trim fiber which has:
 - a total dispersion between 14 and 21 ps/nm/km at 1550 nm, and
 - a positive dispersion slope of between 0.04 and 0.07 ps/nm²/km at 1550 nm.
20. A dispersion compensation fiber, comprising:
 - a refractive index profile including
 - a central core having a positive core delta ($\Delta 1$) less than 2.0% and an outer radius ($R1$) between 1.2 and 3.1 microns,
 - a first moat having a moat delta ($\Delta 2$) more negative than -0.2 % and an outer radius ($R2$) of between 4.5 and 10.6 microns,
 - a ring having a positive ring delta ($\Delta 3$) greater than 0.2 % and a center radius ($R3$) of between 6.5 and 12.0 microns, and
 - a second moat having a delta ($\Delta 4$) less than -0.05% and an outer radius ($R5$) between 19.5 and 37.5 microns;
 - the refractive index profile selected to provide
 - a total dispersion less than -40 and greater than -400 ps/nm/km at 1550 nm;
 - a dispersion slope of between -0.75 and -8.5 ps/nm²/km at 1550 nm; and
 - kappa, defined as total dispersion at 1550 nm divided by dispersion slope at 1550 nm, of greater than 40 and less than 75 nm.